

Seasonal prediction in northern Atlantic Ocean and Norwegian Seas

Noel Keenlyside^{1,2,3}, Sunil Pariyar^{1,3}, Ingo Bethke^{1,3}, Yiguo Wang^{2,3}, and Francois Counillon^{2,3}

¹University of Bergen, Geophysical Institute, Bergen, Norway, ²Nansen Environmental and Remote Sensing Center, Bergen, Norway, ³Bjerknes Centre for Climate Research, Bergen, Norway

1. Main research question: What are the sources of seasonal SST prediction skill of NorCPM over the North Atlantic?

2. Model and data

Norwegian Climate Prediction Model version 1 with Ensemble Kalman Filter data assimilation method

- Historical simulation: 30 ensemble members
- Hindcasts: decadal hindcast starting in 15 October (10 ensemble members)
- NOAA OI-SST (1982-2018)

3. SST prediction skill

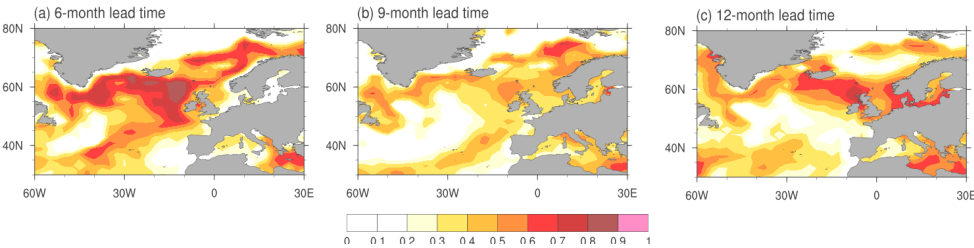


Fig. 1. Monthly anomaly correlation coefficients between NorCPM hindcasts and NOAA-OI SST from 1982 to 2018

4. Contribution from low (>5-years) frequency variability

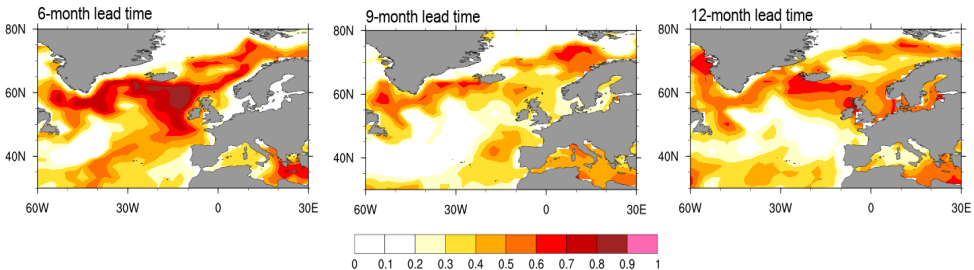


Fig. 2. Monthly anomaly correlation coefficients between NorCPM hindcasts and NOAA-OI SST from 1982 to 2018 based on 5 years lowpass filtered data

4. Contribution from external forcing and internal variability

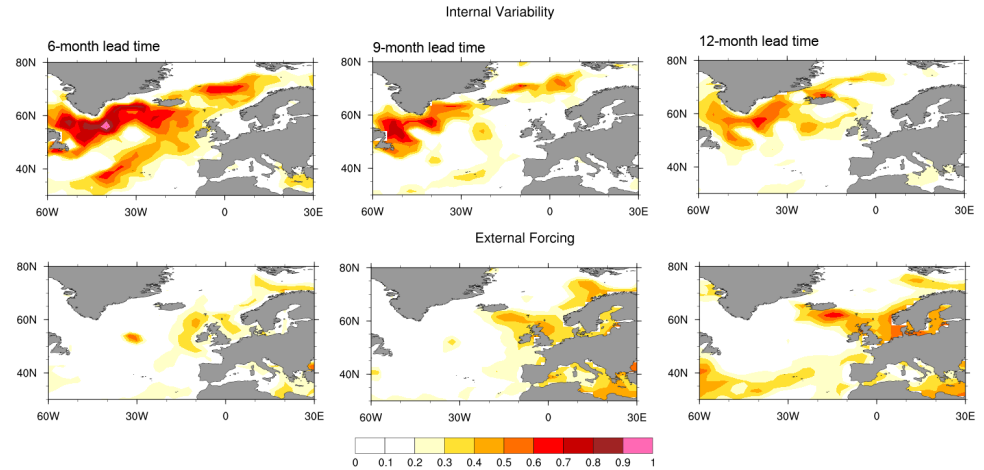


Fig. 3. Monthly anomaly correlation coefficients between NorCPM hindcasts and NOAA-OI SST from 1982 to 2018. The total skill is separated into internal variability (top panel) and external forcing (bottom panel).

5. Role of Ocean (Annual ocean heat budget)

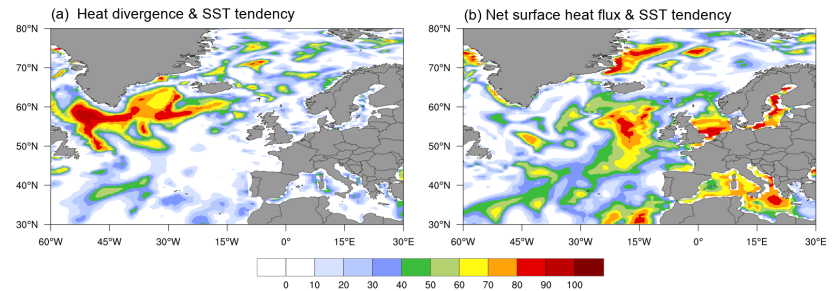


Fig. 4. Annual SST tendency variance explained (%) by column integrated heat divergence and net surface heat flux